TITLE: SELF-PROPELLED MOWER HAVING
ENHANCED MANEUVERABILITY
INVENTOR: Kenneth Edward Hunt
DOCKET #: 16359 DI /deb, mah

FIG. 1

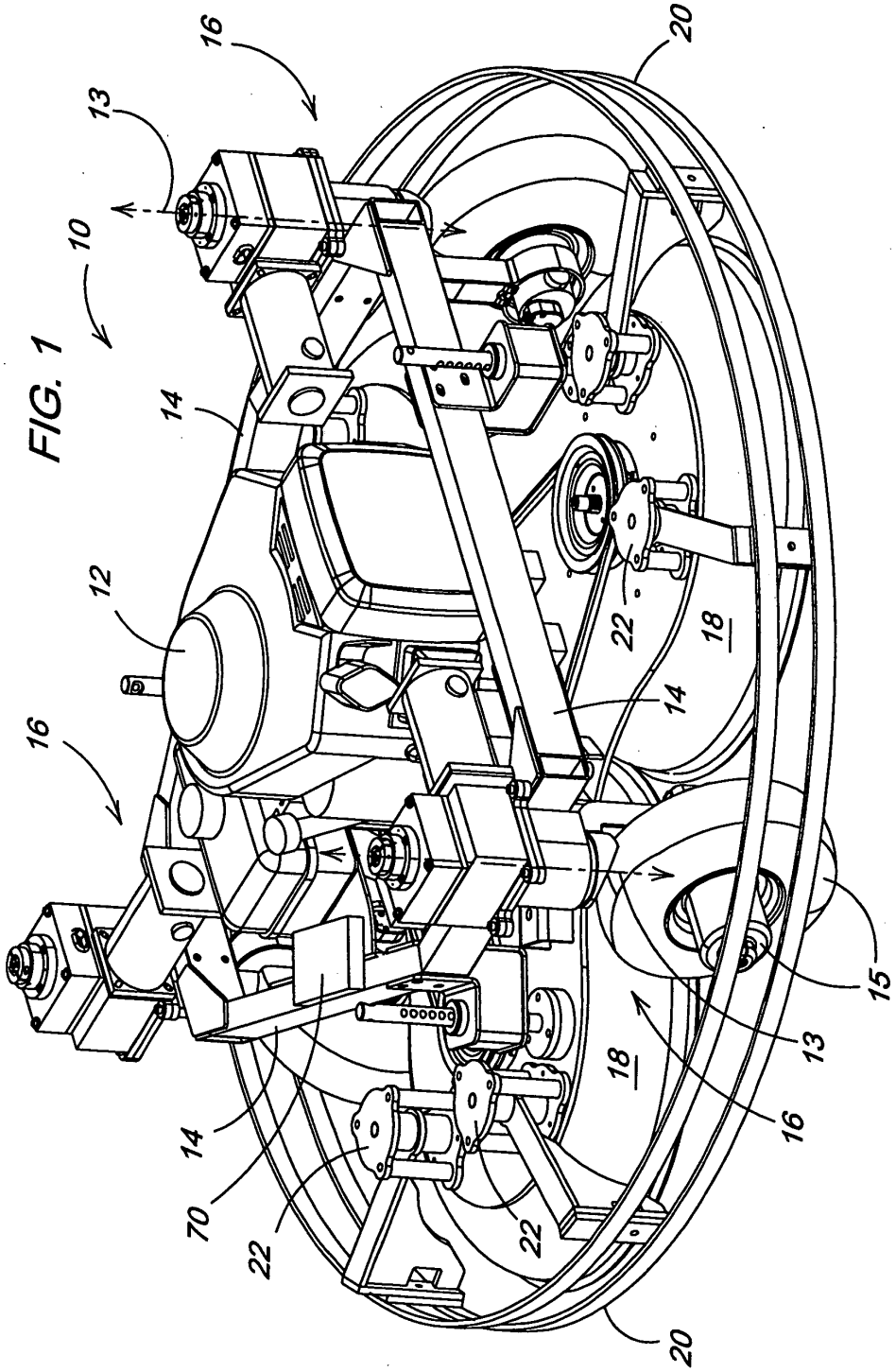

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FIG. 2

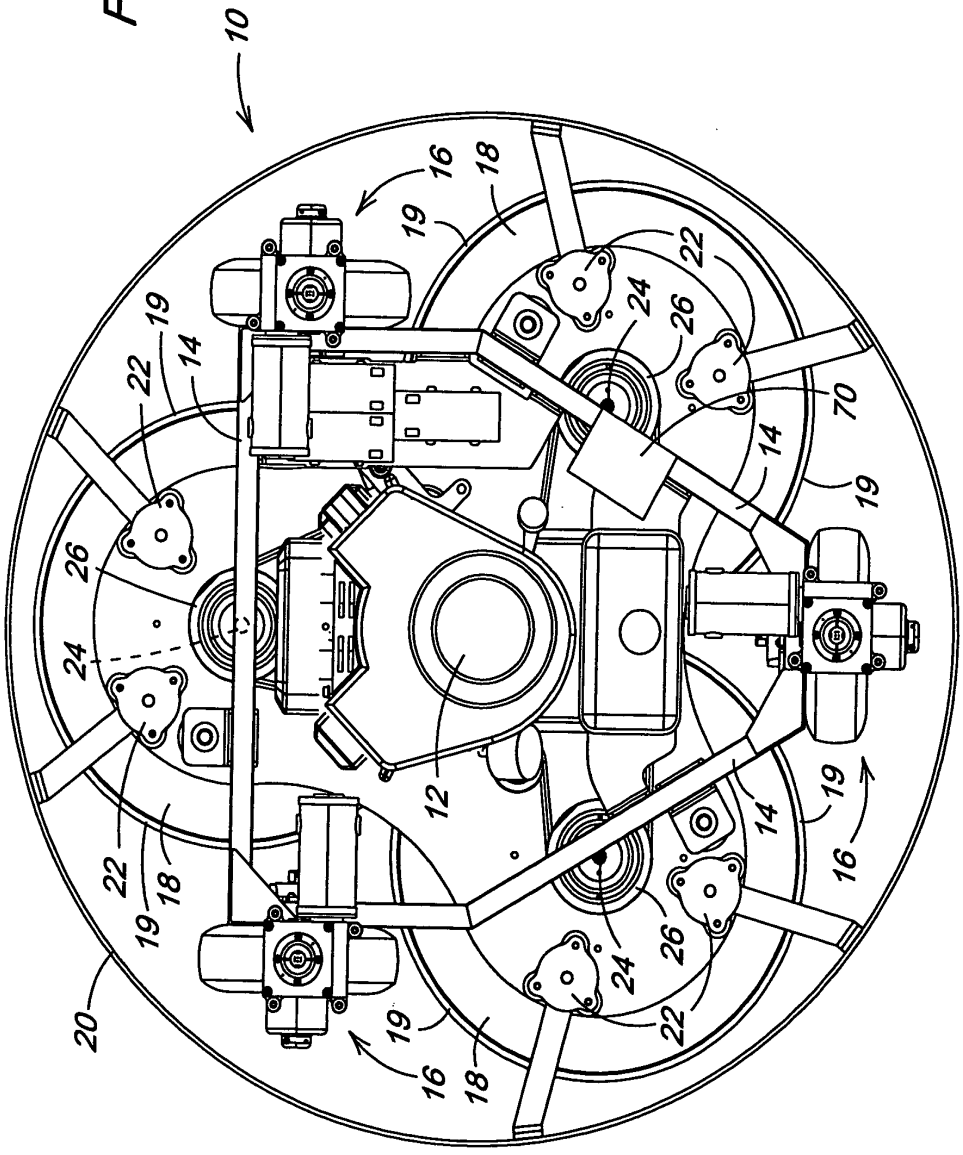

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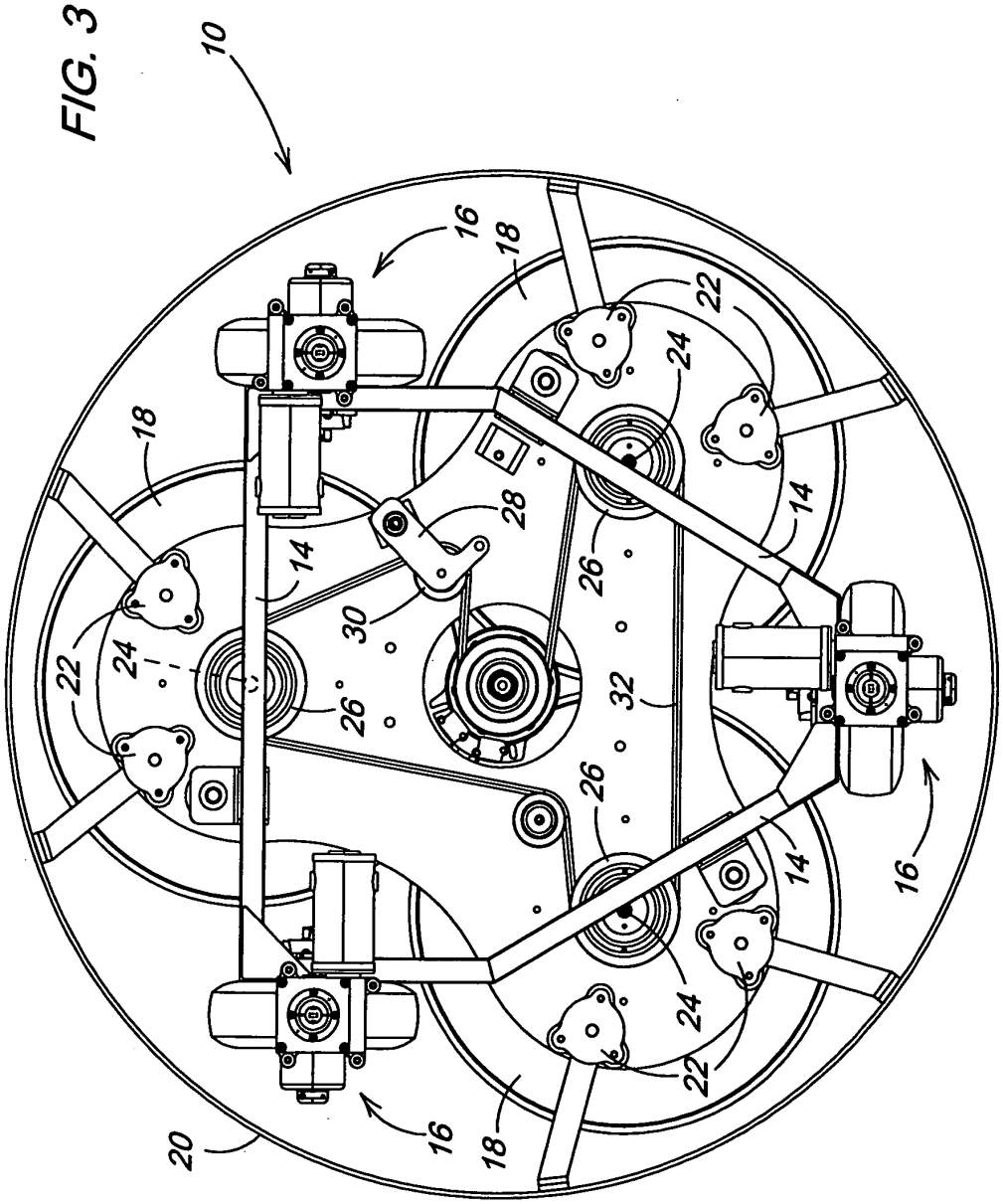
FIG. 3



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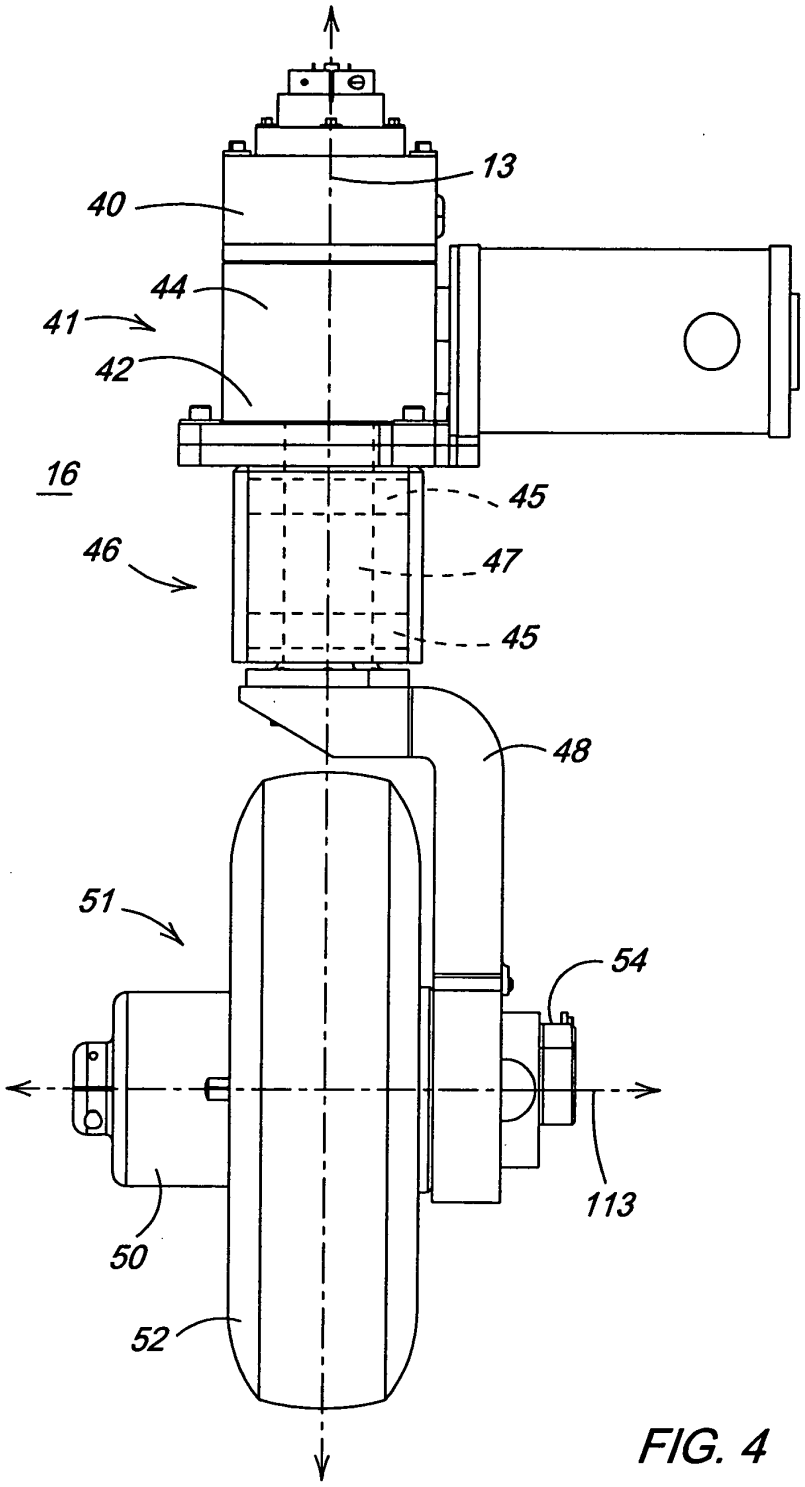


FIG. 4

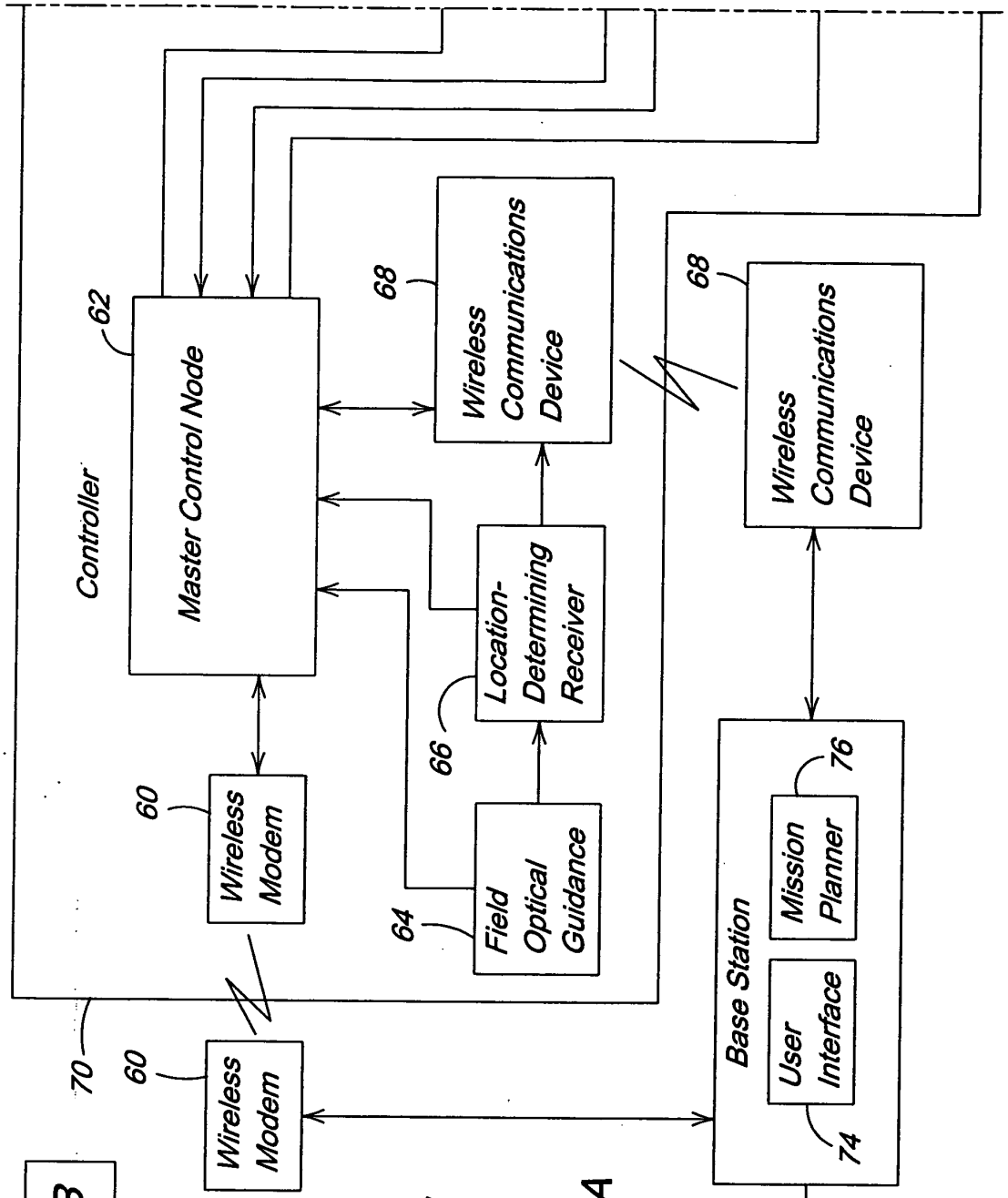


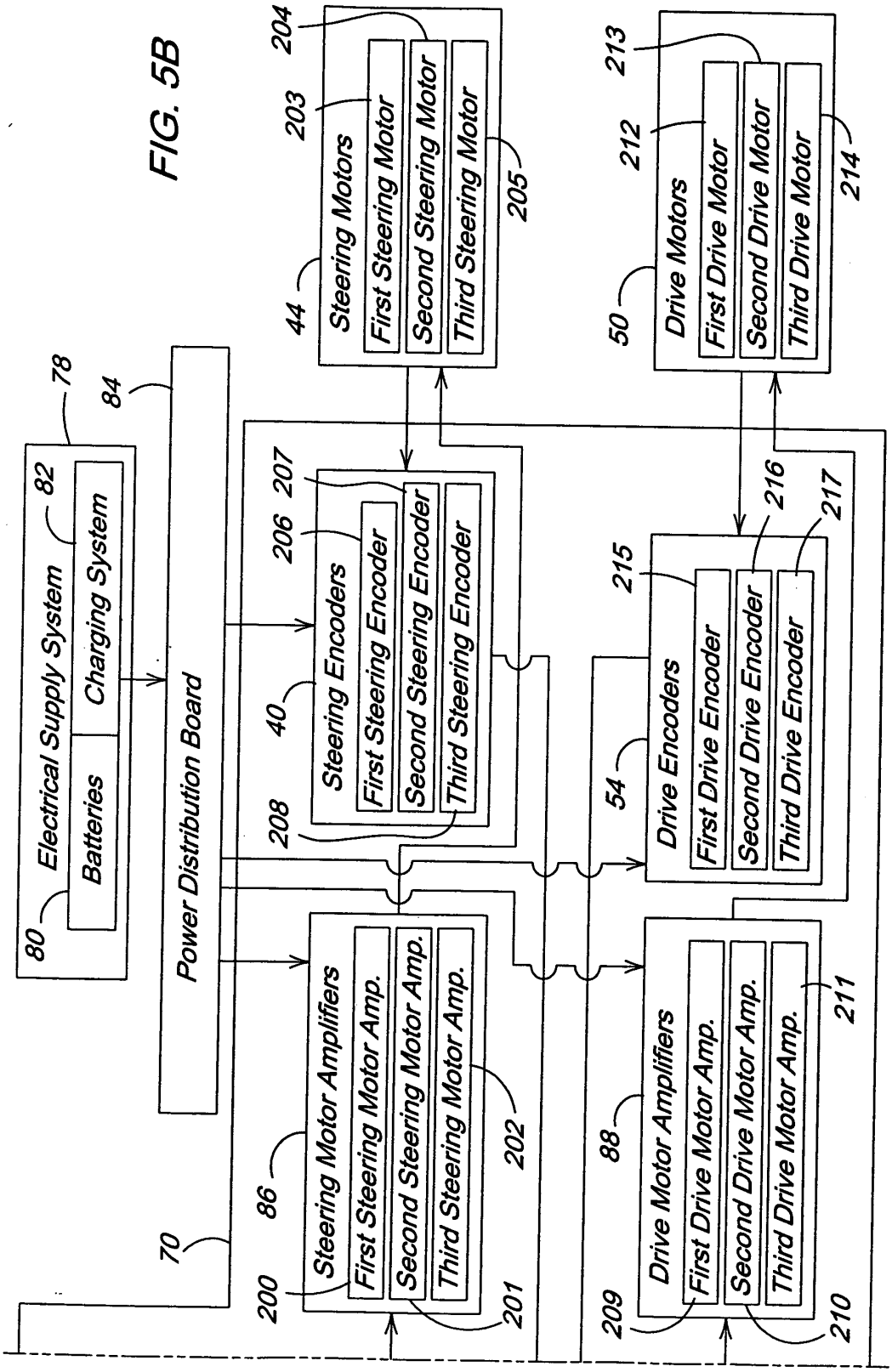
FIG. 5A

FIG. 5

FIG. 5A | FIG. 5B

TITLE: SELF-PROPELLED MOWER HAVING ENHANCED MANEUVERABILITY
INVENTOR: Kenneth Edward Hunt
DOCKET #: 16359 D1 /deb, mah

FIG. 5B



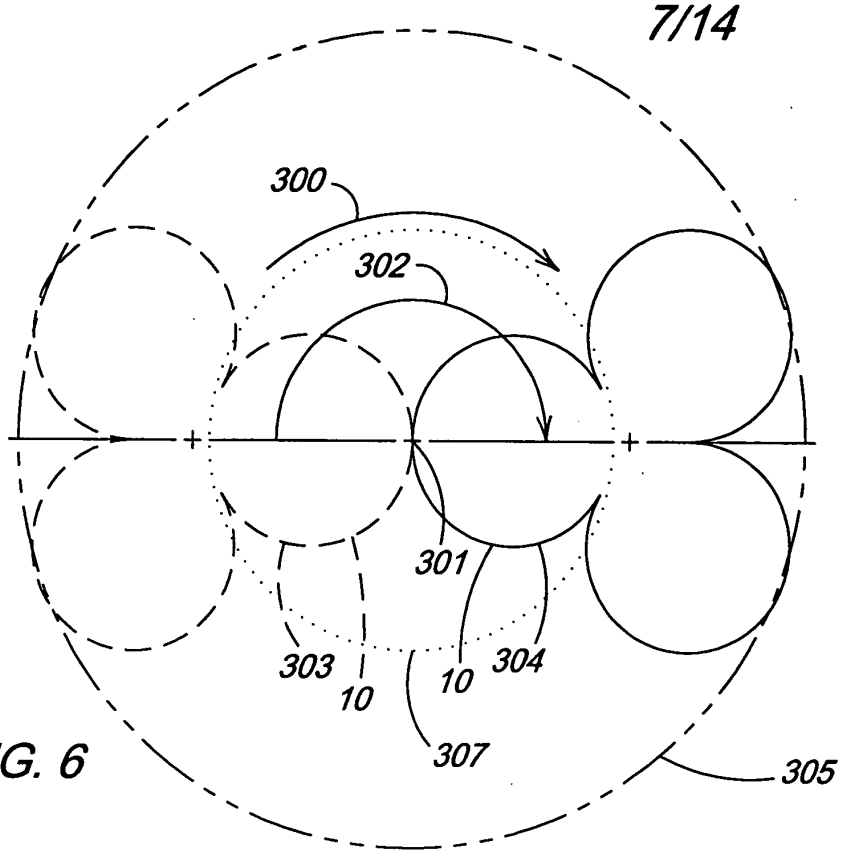

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FIG. 6

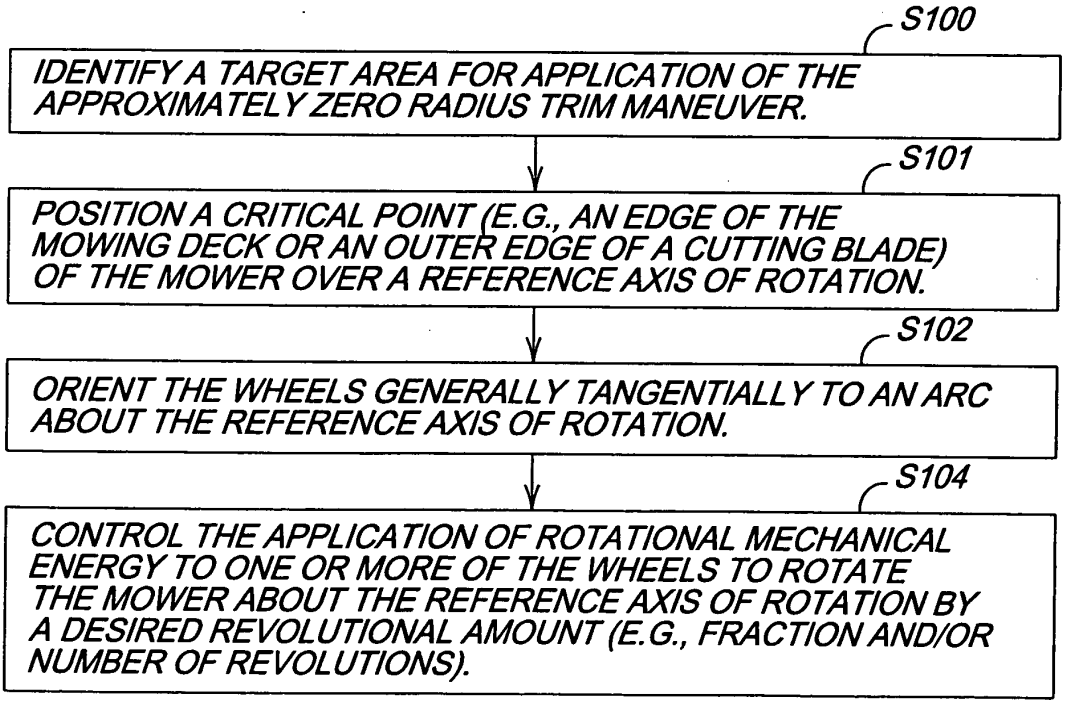
S100
IDENTIFY A TARGET AREA FOR APPLICATION OF THE APPROXIMATELY ZERO RADIUS TRIM MANEUVER.
S101
POSITION A CRITICAL POINT (E.G., AN EDGE OF THE MOWING DECK OR AN OUTER EDGE OF A CUTTING BLADE) OF THE MOWER OVER A REFERENCE AXIS OF ROTATION.
S102
ORIENT THE WHEELS GENERALLY TANGENTIALLY TO AN ARC ABOUT THE REFERENCE AXIS OF ROTATION.
S104
CONTROL THE APPLICATION OF ROTATIONAL MECHANICAL ENERGY TO ONE OR MORE OF THE WHEELS TO ROTATE THE MOWER ABOUT THE REFERENCE AXIS OF ROTATION BY A DESIRED REVOLUTIONAL AMOUNT (E.G., FRACTION AND/OR NUMBER OF REVOLUTIONS).

FIG. 7

TITLE: SELF-PROPELLED MOWER HAVING ENHANCED MANEUVERABILITY
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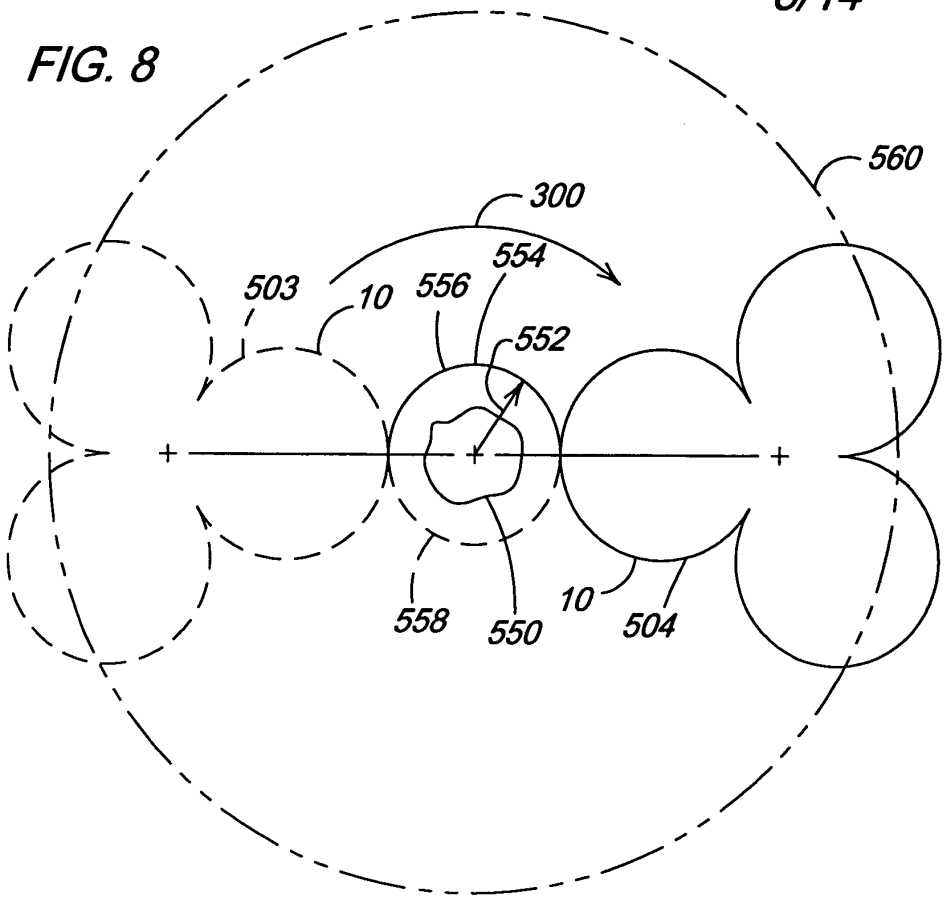
FIG. 8



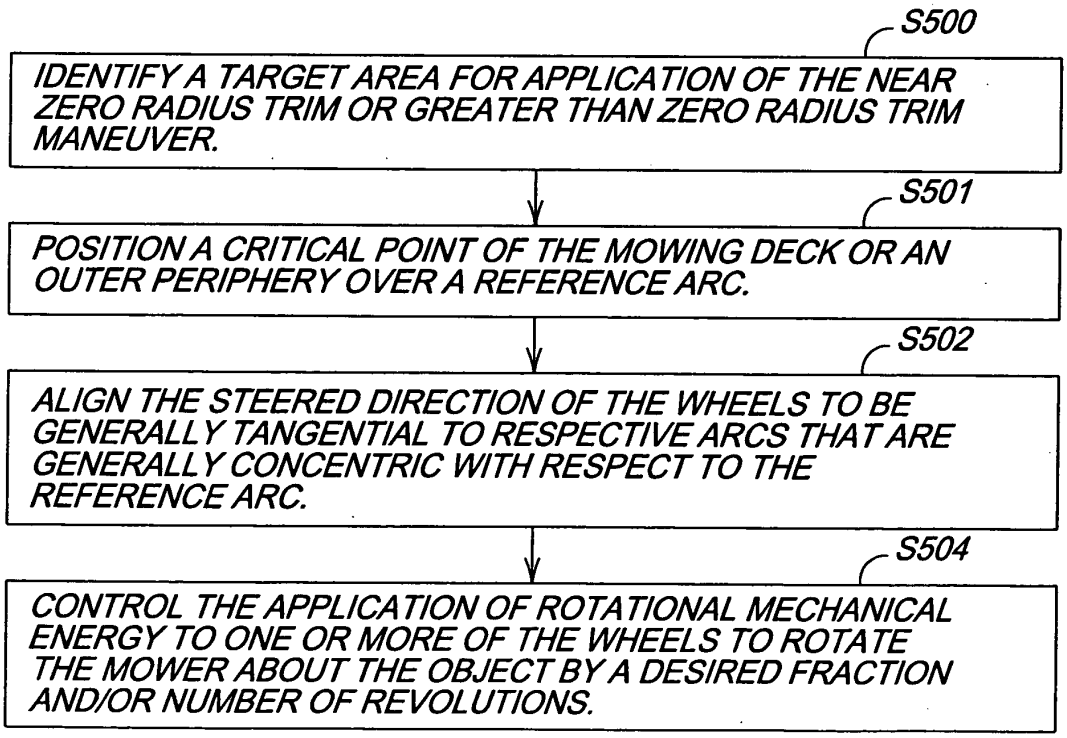


FIG. 9

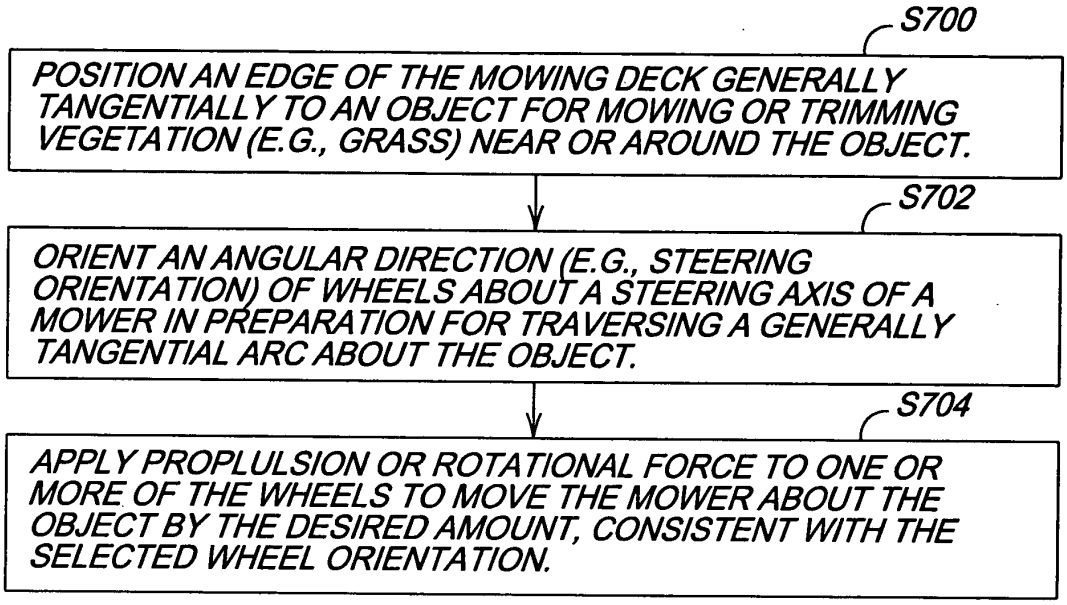

S700
POSITION AN EDGE OF THE MOWING DECK GENERALLY TANGENTIALLY TO AN OBJECT FOR MOWING OR TRIMMING VEGETATION (E.G., GRASS) NEAR OR AROUND THE OBJECT.
S702
ORIENT AN ANGULAR DIRECTION (E.G., STEERING ORIENTATION) OF WHEELS ABOUT A STEERING AXIS OF A MOWER IN PREPARATION FOR TRAVERSING A GENERALLY TANGENTIAL ARC ABOUT THE OBJECT.
S704
APPLY PROPLULSION OR ROTATIONAL FORCE TO ONE OR MORE OF THE WHEELS TO MOVE THE MOWER ABOUT THE OBJECT BY THE DESIRED AMOUNT, CONSISTENT WITH THE SELECTED WHEEL ORIENTATION.

FIG. 10

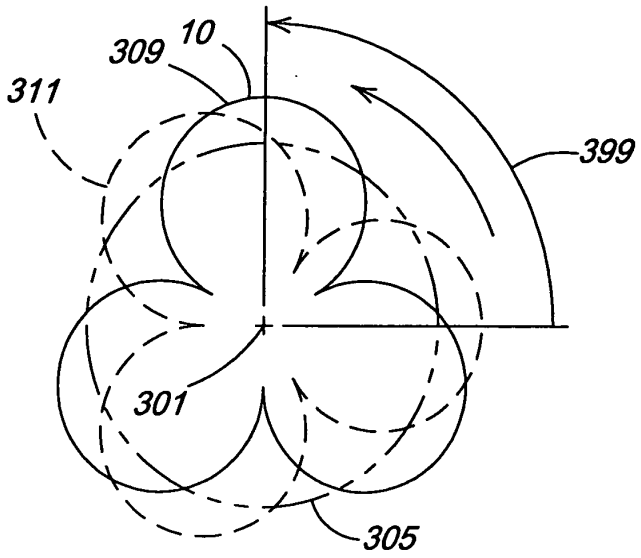

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FIG. 11

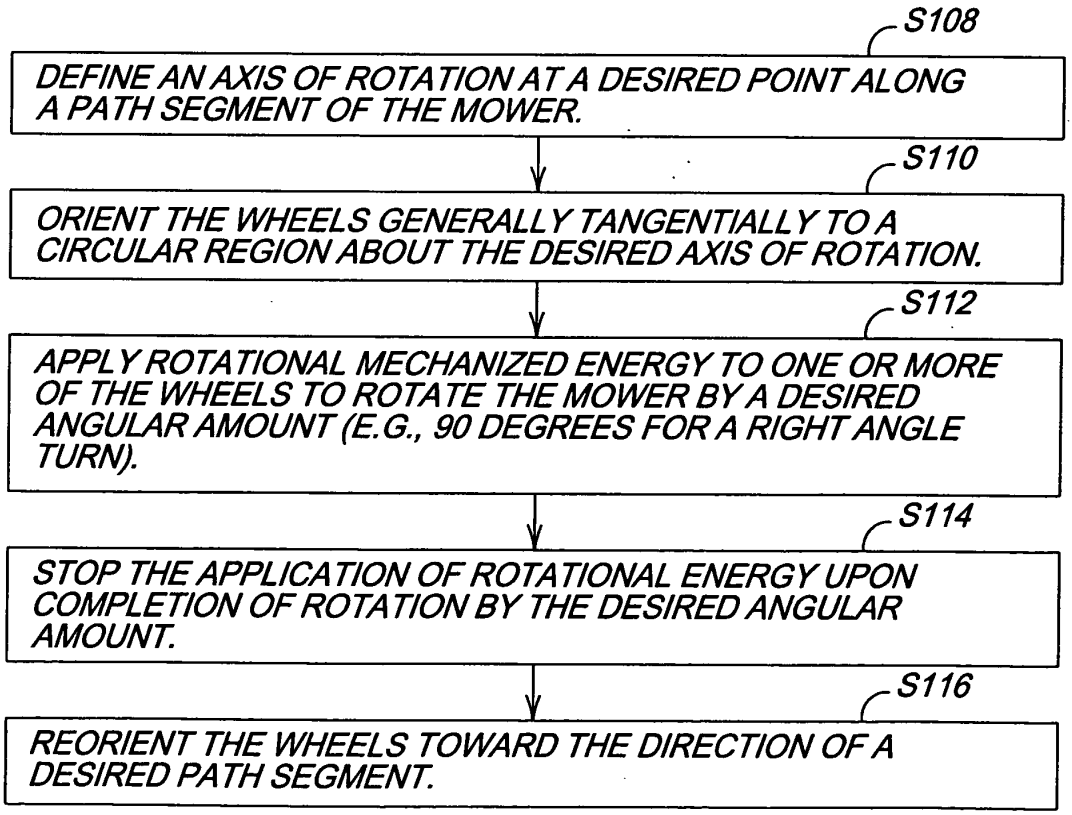
S108
DEFINE AN AXIS OF ROTATION AT A DESIRED POINT ALONG A PATH SEGMENT OF THE MOWER.
S110
ORIENT THE WHEELS GENERALLY TANGENTIALLY TO A CIRCULAR REGION ABOUT THE DESIRED AXIS OF ROTATION.
S112
APPLY ROTATIONAL MECHANIZED ENERGY TO ONE OR MORE OF THE WHEELS TO ROTATE THE MOWER BY A DESIRED ANGULAR AMOUNT (E.G., 90 DEGREES FOR A RIGHT ANGLE TURN).
S114
STOP THE APPLICATION OF ROTATIONAL ENERGY UPON COMPLETION OF ROTATION BY THE DESIRED ANGULAR AMOUNT.
S116
REORIENT THE WHEELS TOWARD THE DIRECTION OF A DESIRED PATH SEGMENT.

FIG. 12

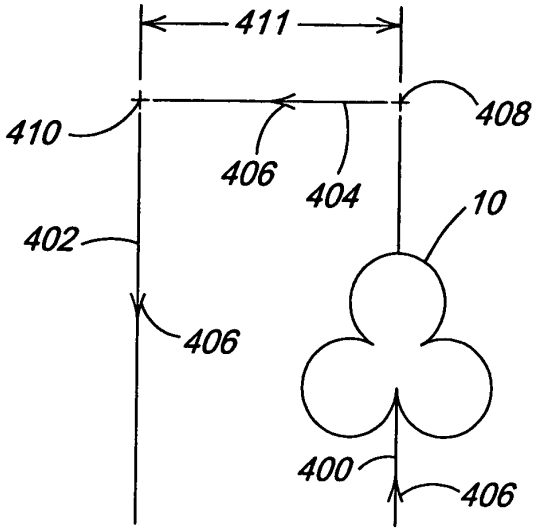
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FIG. 13

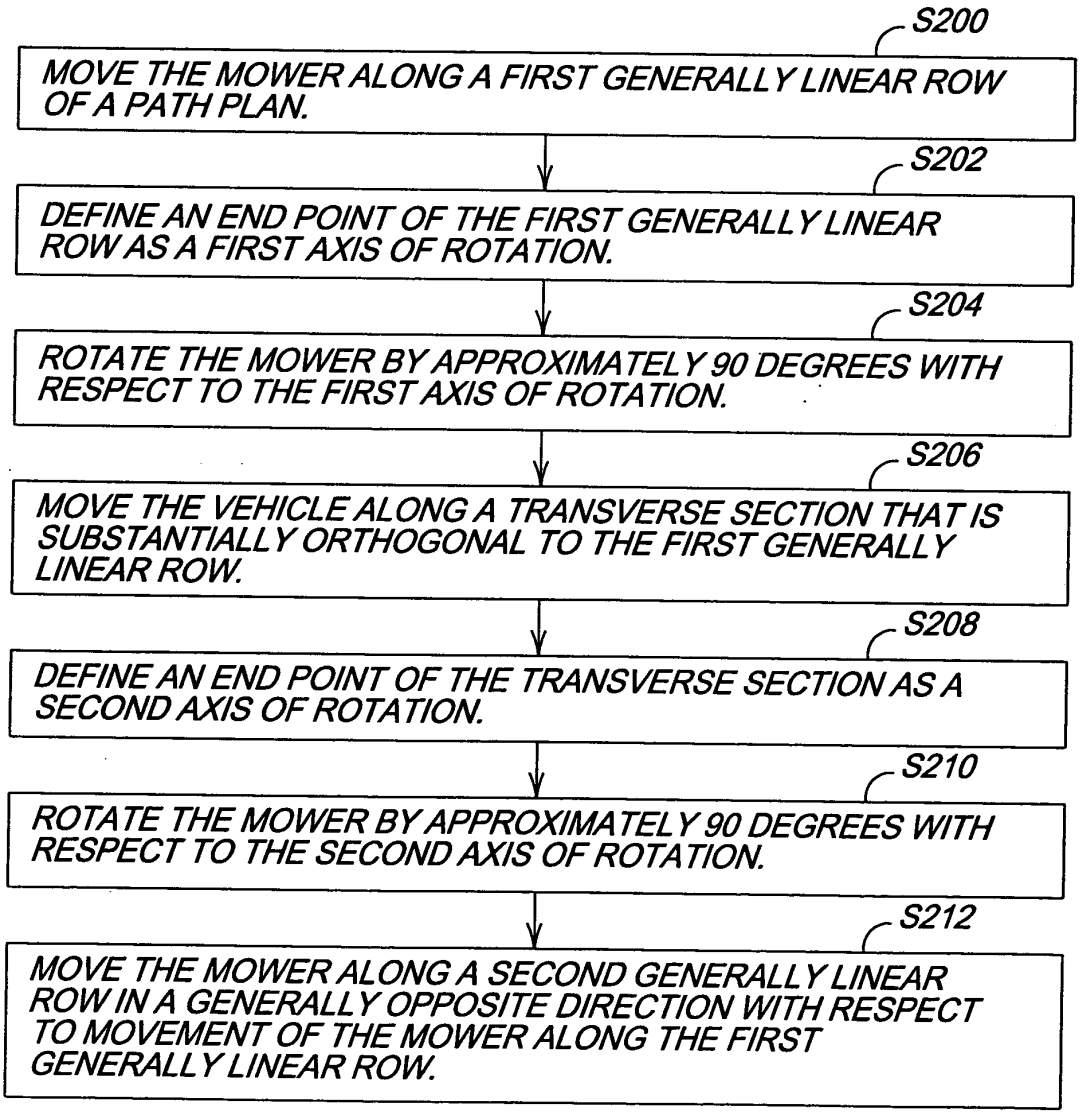
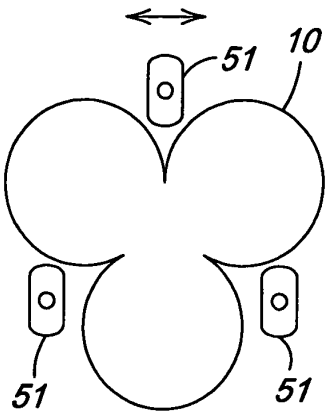
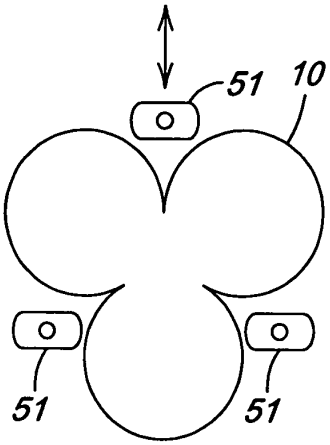

S200
MOVE THE MOWER ALONG A FIRST GENERALLY LINEAR ROW OF A PATH PLAN.
S202
DEFINE AN END POINT OF THE FIRST GENERALLY LINEAR ROW AS A FIRST AXIS OF ROTATION.
S204
ROTATE THE MOWER BY APPROXIMATELY 90 DEGREES WITH RESPECT TO THE FIRST AXIS OF ROTATION.
S206
MOVE THE VEHICLE ALONG A TRANSVERSE SECTION THAT IS SUBSTANTIALLY ORTHOGONAL TO THE FIRST GENERALLY LINEAR ROW.
S208
DEFINE AN END POINT OF THE TRANSVERSE SECTION AS A SECOND AXIS OF ROTATION.
S210
ROTATE THE MOWER BY APPROXIMATELY 90 DEGREES WITH RESPECT TO THE SECOND AXIS OF ROTATION.
S212
MOVE THE MOWER ALONG A SECOND GENERALLY LINEAR ROW IN A GENERALLY OPPOSITE DIRECTION WITH RESPECT TO MOVEMENT OF THE MOWER ALONG THE FIRST GENERALLY LINEAR ROW.

FIG. 14



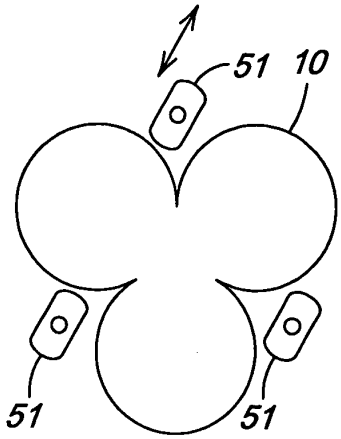
Linear Mode

FIG. 15A



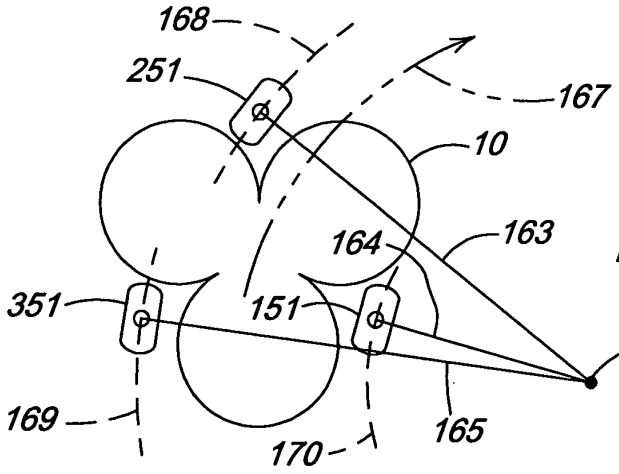
Linear Mode

FIG. 15B



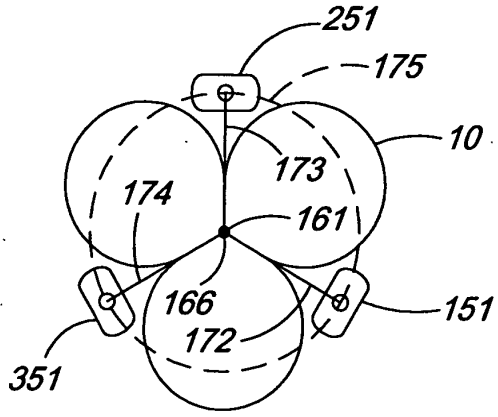
Linear Mode

FIG. 15C



Arc Mode

FIG. 16



Rotating Mode

FIG. 17

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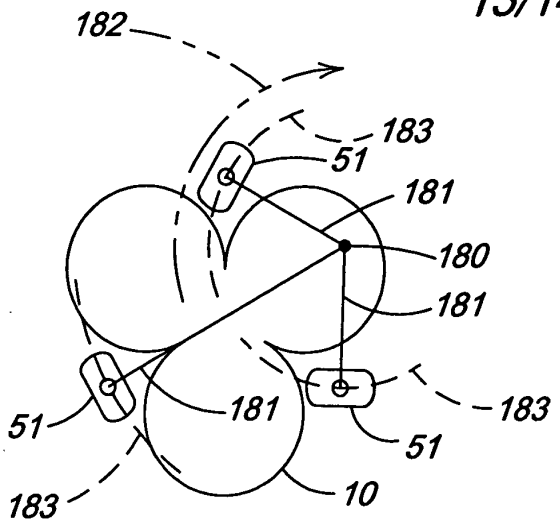
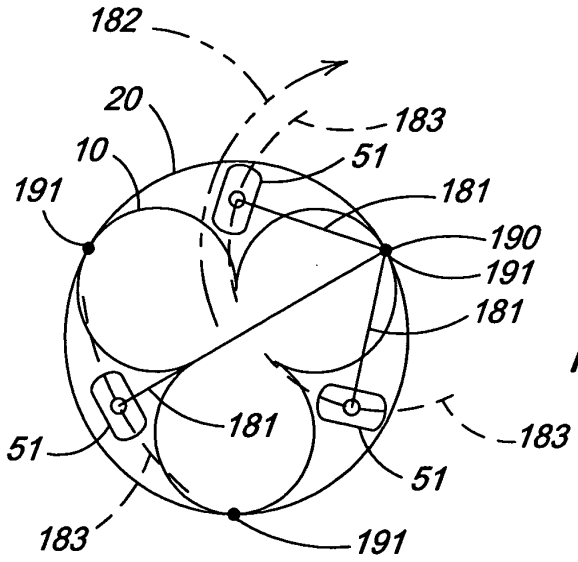


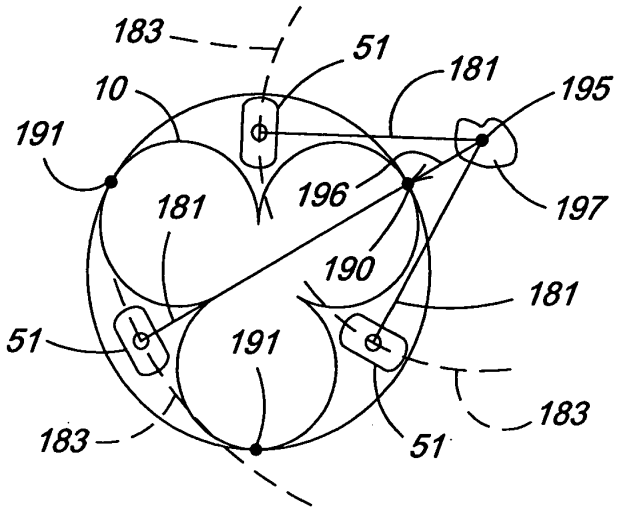
Interior Arc Mode

FIG. 18



Trim Mode (Zero Radius)

FIG. 19



Trim Mode
(Greater Than Zero Radius)

FIG. 20

FIG. 21

- Path Plan Data
  - 1st Path Segment
    - Starting Coordinate (X_1, Y_1)
    - Destination Coordinate (X_2, Y_2)
    - Mode (E.g., Linear, Arc, Rotating or Combination) (M_1)
    - Reference Point Coordinate (Where Applicable) (R_1)
  - 2nd Path Segment
    - Starting Coordinate (X_2, Y_2)
    - Destination Coordinate (X_3, Y_3)
    - Mode (M_2)
    - Reference Point (R_2)
    - •
    - •
  - Nth Path Segment
    - Starting Coordinate (X_N, Y_N)
    - Destination Coordinate (X_{N+1}, Y_{N+1})
    - Mode (M_N)
    - Reference Point (R_N)

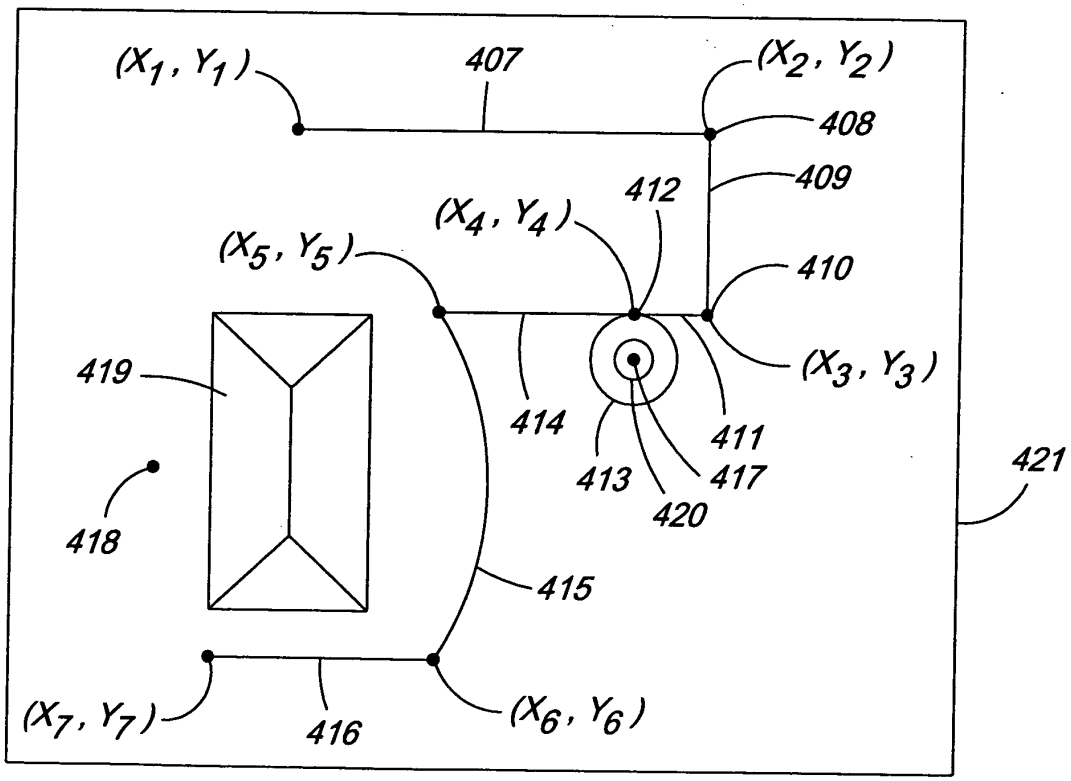


FIG. 22